The Management of Urine Storage Dysfunction in the Neurological Patient

VALORISATION

Neurological disorders or lesions can readily impair LUT function due to its dependency on complex, multilevel neuronal control. The overall prevalence of neurological disorders and lesions impairing LUT function is very high and affects millions of people worldwide. The most common neurological disorders typically associated with LUTD are multiple sclerosis, Parkinson's disease, and cerebrovascular disease with a world-wide crude prevalence per 100'000 population of 20-100, 100-200, and 500-1000, respectively [1]. In addition there are hereditary and acquired spinal cord lesions such as spina bifida, and traumatic and non-traumatic (e.g. ischemic, infectious, malignancy related) spinal cord injuries with world-wide crude prevalence rates of 30-40 per 100'000 pregnancies [2], 30-130 per 100'000 population, and 40-120 per 100'000 population, respectively [3]. Finally, there is a large group of patients suffering from peripheral nerve damage secondary to diabetes mellitus or pelvic surgery.

Depending on the extent and progression, all these neurological diseases and lesions cause LUTD / LUTS in at least 15% and up to 99% of affected patients [4, 5], making NLUTD a frequent health problem with an enormous economic burden for every healthcare system. This becomes even more obvious considering that almost none of the underlying neurological diseases or lesions are curable, which makes life-long neuro-urological follow-up a necessity.

NLUTD may occur immediately or during the course of a neurological disease leading to (1) additional psychological burden due to embarrassment, depression, and eventually social isolation related to LUTS such as urinary frequency and incontinence and (2) physical damage such as skin ulcers, recurrent urinary tract infections, and renal impairment [4].

Adequate management and follow-up of NLUTD is thus mandatory for improving quality of life and preventing secondary damage to health.

Although this principle appears obvious, it still lacks sufficient implementation in many healthcare systems [6].

This thesis provides, on the one hand, a comprehensive overview of the neuropathophysiological background and current management of NLUTD and, on the other, several first-of-its-kind studies on important but previously unknown clinical aspects of currently available treatments for NLUTD. The chosen focus on BoNT/A intradetrusor injections in this thesis is due to its revolutionary impact on NLUTD management. Prior to BoNT/A intradetrusor injections, patients refractory to antimuscarinic treatment were restricted to surgery, e.g. bladder augmentation, ileal conduit. Nowadays, BoNT/A intradetrusor injections have significantly improved the QoL of many patients with NLUTD and helped to protect their upper urinary tract function without major surgery. However, despite the benefits of this treatment, many aspects of BoNT/A intradetrusor injections remain unknown and require further investigation before we can fully explore and utilize the true potential of this drug.

The output of this thesis may help to (1) raise awareness of urologists, neurologists, and rehabilitation physicians of the importance of diagnosis, treatment, and follow-up of NLUTD, (2) optimize the use of BoNT/A intradetrusor injections for NLUTD in multiple sclerosis and other neurological patients, (3) improve treatment of neurogenic stress urinary incontinence in neurological patients, and (4) stimulate new research into the use of BoNT/A in the treatment of NLUTD to improve its benefit / risk ratio and explore proposed accessory effects to make the full treatment potential of BoNT/A available.

Hence, this thesis provides new treatment concepts for NLUTD but also suggests new pathways and targets for further research specifically on BoNT/A injections within the LUT. The great advantage of exploiting and optimizing treatments that are already on the market and approved, as

presented in this thesis, is the direct availability and applicability for our patients.

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